

## ABSTRACT

The present invention provides films and substrates coated with films that comprise a nano-crystalline diamond matrix that is substantially free of graphite inclusions. The present invention also provides a method of chemical vapor deposition to prepare the films. The method of chemical vapor deposition operates at a DC bias voltage that substantially precludes the formation of a plasma ion capable of causing a region of a nano-crystalline diamond matrix within a forming film to allotrope when the plasma ion collides with the film.

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